

In the Claims


1. (canceled).

2.-3. (canceled).

4 - 9. (canceled).

10. (canceled).

11-19. (canceled).



20. (new) An aluminum weld stud comprising a shank and a head extending along one end of the shank, wherein the shank and head comprise aluminum or an aluminum alloy, and wherein the stud comprises a surface comprising aluminum or an aluminum alloy, wherein a portion of the surface is treated with an acidic solution containing titanium ions to provide a titanium containing material on the surface.

21. (new) A stud according to claim 20, wherein the acidic solution is chromium free.

22. (new) A stud according to claim 20, wherein the acidic solution comprises ALODINE® 2040.

23. (new) A stud according to claim 22, wherein the head comprises a tapered portion forming a welding face, and wherein the welding face comprises the titanium containing material.

24. (new) A stud according to claim 20, wherein the stud further comprises threads disposed around the shank.

25. (new) A method for attaching an aluminum weld stud to a substrate, the stud comprising a shank and a head extending along one end of the shank, the method comprising arc welding the head of the stud to the substrate, wherein the stud head comprises aluminum or an aluminum alloy and has a surface comprising a titanium containing material.

26. (new) A method according to claim 25, wherein the titanium containing material is applied to the surface of the stud head by immersing in an acidic solution comprising titanium ions.

27. (new) A method according to claim 26, wherein the acidic solution is chromium free.

28. (new) A method according to claim 25, wherein the acidic solution has a free acid content of between 6.1 and 18.3.

29. (new) A method according to claim 25, wherein the substrate comprises a sheet material.

30. (new) A method according to claim 29, wherein the sheet material comprises aluminum or an aluminum alloy.

31. (new) A method according to claim 29, wherein the sheet material comprises an auto body panel for a motor vehicle.

32. (new) A method for welding an aluminum weld stud to an auto body panel made of aluminum comprising;

providing at least the surface of the stud to be welded with a titanium containing material, and

arc welding the stud to the panel.

33. (new) A method according to claim 32, wherein providing at least the surface of the stud with a titanium containing metal comprises coating the surface in an acidic solution containing titanium ions.

34. (new) A method according to claim 33, wherein the solution has a free acid content to between 6.1 and 18.3.

35. (new) A method according to claim 33, comprising dipping the surface in the solution for 30 to 90 seconds.

36. (new) A method according to claim 34, wherein the acidic solution is at about 45°C.

37. (new) A method according to claim 33, wherein the acid solution is chromium free.

38. (new) A method according to claim 33, wherein the acidic solution comprises ALODINE® 2040.
